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Indian Standard

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समानान्तर नहरों के आयोजन — दिशानिर्देश

Planning of Parallel Canals — Guidelines

ICS 93.160

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Canals and Cross Drainage Works Sectional Committee, WRD 13

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Canals and Cross Drainage Works Sectional Committee had been approved by the Water Resources Division Council.

Canals have played an important role in creating assured irrigation supplies to agricultural fields and contributed substantially to the green revolution in the country. With the increase in demand of food and fodder, demand of water for irrigation is also rising. To meet the increasing requirement of water, need for constructing new canals has become obvious. For cost effectiveness, a parallel canal to the existing canal is a judicious choice by utilizing one of the banks of the existing canal.

Only general guidelines with regard to planning and construction of parallel canals are given in this standard, for the assistance of the designer. But each project should be individually analyzed taking into consideration its peculiar features.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PLANNING OF PARALLEL CANALS — GUIDELINES

1 SCOPE

This standard deals with various aspects which are generally considered while planning and construction of parallel canals particularly of large capacities.

2 REFERENCES

The following standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated below:

IS No.	*Title*
3873 : 1993	Laying cement concrete/stone slab lining on canals — Code of practice (*second revision*)
4558 : 1995	Code of practice for under-drainage of lined canals (*second revision*)
7112 : 2002	Criteria for design of cross-section for unlined canals in alluvial soil (*first revision*)
10430 : 2000	Criteria for design of lined canals and guidelines for selection of type of lining (*first revision*)

3 CONSIDERATIONS IN REGARD TO PARALLEL CANAL PROPOSITION

3.1 The construction of parallel canal under modernization programme has the following advantages:

a) No closure of canal is required when the works on modernization of canal is undertaken by constructing a new parallel canal; in this way, the agricultural production of the command area of the canal does not suffer due to lack of irrigation water.

b) Even if the existing canal is re-modelled for increasing its discharge capacity or improving its conveyance efficiency by closing it intermittently or otherwise for different construction activities, the proposal becomes time consuming and uneconomical in comparison to the construction of a new parallel canal.

c) It is normally seen that the problems associated with land acquisition and relocation of displaced populations would be least in comparison to a new alignment as land adjoining existing canal alignment are seen to be government land, not presently under cultivation, at the disposal of irrigation departments in most cases.

3.2 Though the aspects indicated in **3.1** demonstrate the desirability and to some extent the economics of the parallel canal, certain inherent technical problems should be carefully looked into in all such proposals. These are:

a) Problem of increased pore pressure development in the common bank of the twin canals surfaces as a technical off shoot. This increase is for all conditions of the running of the canal(s).

b) Stability problem of the common bank due to increased pore pressure is not accounted for in the original design, resulting in the instability of the banks of the separating bunds of the parallel canals.

c) In some cases, the old canal is found to be unlined, in general or even if lined, proper provision for releasing hydrostatic pressures behind lining are not made at the time of its initial design. This causes problems of lining failure due to an increase in the pressure behind the lining.

3.2.1 For uninterrupted and efficient operation of parallel canal the following aspects should be carefully addressed in the different phases of the project:

a) Investigation feasibility report/detailed project report (DPR) ; and

b) Planning an appropriate alignment and design of the canal considering the type of soils encountered along the alignment/terrain keeping in view as to whether the existing canal runs in,

    1) Cutting;
    2) Filling; or
    3) Partly in cutting and partly in filling.

4 INVESTIGATIONS

Before planning any parallel canal, a programme for detailed soil investigations along canal alignment at suitable intervals should be launched to assess the classification, strata and engineering properties of sub-strata, ground water table, etc.

4.1 Properties of Sub-Grade

The soil investigations should include determination of type of soil by taking bore hole logs 10-20 m deep (or up to impervious layer, if encountered earlier), spaced at about a kilometer for large canals. Where soil strata are variable, intermediate bore holes should be located to define the soil profile, as best as possible. If the soil stratum continues to be pervious for large depth as indicated by a few deep borings, the stratum may be assumed as extending to infinity for seepage computations. Soil tests to be carried out on bore hole samples should, in addition to usual classification tests, include tests for expansive nature of sub-grade material and chemical tests to guard against presence of any possible deleterious substances, which may adversely affect the lining materials. Sulphates of sodium and magnesium are known to be the worst enemies of concrete and brick. Suitable remedial measures should therefore be adopted in the reaches where total dissolved solids are more than 0.25 percent by weight. Where soils are susceptible to be dispersion, sufficient tests shall be undertaken to assess the situation for evolving remedial measures.

4.1.1 *CH/ Sandy/Gravelly Soils*

Generally, the types of soil that are likely to have the heaviest seepage losses are relatively clean sand and gravel. Uniform gravel have the highest permeability followed by well-graded gravel, uniform and well-graded sand. Another type of material that is usually questionable is highly plastic clay (Casagrande CH type) because of its tendency to develop large shrinkage crack upon drying. This type of soil has small seepage losses when continually wet.

4.1.2 *Silt/Fine Sand*

Other soils that will have moderately heavy seepage losses are very find sands. Silt is inherently unstable, particularly when moisture is increased, with a tendency to become quick when saturated. It is relatively impervious, difficult to compact, highly susceptible to frost heave, easily erodible and subject to piping and boiling. Bulky grains reduce compressibility; flaky grains, that is, mica, diatoms, increase compressibility and produce elastic silt. The classification of soils and their properties in the context canal construction are indicated in Annex A.

4.2 Ground Water Table

Data of water table in monsoon and spring for a few years shall be collected. Large number canal failure has been on account of high water table and therefore, the design of canal section should be such that in most of the reaches, the bed level of canal is fixed above highest ground water table, to the maximum extent possible. Where this is not feasible, extensive drainage arrangement is called for.

4.3 Drainage for Banks

4.3.1 The parameters that should be investigated for planning of a parallel canal in a certain area include type and permeability of the sub-grade in different reaches, water table conditions, quantitative assessment of seepage losses and area likely to be waterlogged.

4.3.2 In such cases, the operational conditions and engineering properties of the sub-grade material of the two canals should be studied in detail; physical model studies by electrical analogy method or numerical modelling using finite difference/element method. The results of model studies are to be used to design suitable treatment work for the common bank and drainage behind lining of canal.

5 PLANNING AND DESIGN ASPECTS OF PARALLEL CANALS

5.1 Bank Width

The top width of common bank should be kept as twice the width of inspection path for the corresponding range of discharges given in IS 10430. However, this may be changed suitably in order to ensure that the phreatic line (Hydraulic gradient line) is below the beds of existing as well as new canal. The hydraulic gradient (H.G.) line through bank, though actually curved is assumed to be straight and slopping at 1 : 4 to 1 : 6 gradient, depending upon the prevailing boundary condition at sites (*see* IS 7112).

5.2 Side Slopes

For side slopes for unlined canal and lined canal, *see* IS 7112 and IS 10430, Respectively

5.3 Canal in Filling

When the canal is in filling, the following options can be studied to ensure proper drainage and to avoid back pressures which can cause failures of slopes/canal lining in the other parallel canal. The strategy for planning shall differ for various reaches of canals depending on the canal reaches in filling or cutting below the new canal.

5.3.1 *Method-1 Provision of Suitable Filter Layer Below the New Canal*

This filter shall not allow development of unnecessary high pore pressures in the common bank. It will reduce the pore pressures which would have developed in the far end bank of the new canal, as the filter will work as a source of pressure release path for both the affected banks in all cases of operation of the twin canals. Figure 1(A) shows the details for a typical section.

5.3.2 *Method-2 Impervious Barriers and Drains Between Parallel Canals*

The provision of a trench filled-up with filter material having an open jointed AC or perforated PVC pipe in the centre can operate as impervious barrier/drain. This open jointed pipe shall work as pore pressure reducer and seepage collector. The size and location of the trench, which depends on the permeability of the sub-grade, should be decided by electrical analogy model studies or numerical modeling using finite difference/element method. The seepage may be discharged into the side drains at suitable locations of the canal with the help of cross drain or the outlet provided in some local drain, crossing the canal system. The arrangement for a typical section is shown in Fig. 1(B).

5.3.3 *Method-3 Provision of Horizontal Filter Layers in Fill for New Canal*

If the new canal is in embankment then for the release of pore pressures, filters should be provided. Depending on the height of fill, these filters may be provided at different locations on the common bank and at the far end bank of the new canal. The arrangement for a typical section is shown in Fig. 1(C).

5.3.4 *Method-4 Lined Canals*

When lining is provided, depending upon sub-grade, drainage arrangements shall be provided. The arrangement for a typical section is shown in Fig. 2.

5.4 Canal in Cutting

When the new canal is in excavation and the spring levels are low, the methods suggested in **5.3** may not be practically possible to construct. In such cases, for general guidance for side slopes, see IS 7112 and IS 10430 for unlined canal and lined canal, respectively. For the lined canals extra provisions of filter behind the lining, extensive network of drains with pressure release valves (non-return) or provision of dwarf regulators are suggested. Figure 3 indicates drainage arrangements for a typical section for non-free drainage and free drainage sub-grade.

5.5 Provision of Outlets, Cross Drainage (CD) Works and Control Structures

Whenever a parallel canal is planned alongside the existing canal, those outlets which are towards the common bank will need to be replaced and provided through the other bank of the new parallel canal unless the bed level of the new parallel canal is sufficiently above the outlet level.

Extension of CD works and control structures which is required only in case of super-passage, canal siphon and road bridge crossings, the width of common bank as suggested under **5.1** (that is 8 to 12 m) shall suffice the purpose. In case of aqueduct, siphon aqueduct and falls, a separate structure for new parallel canal shall, in any case, be provided.

5.6 Connectivity of Old and New Canals

Interconnectivity between the parallel canal (old and new reach) shall be of immense help in the event when major repair/renovation work in one canal is to be attended while keeping the supply of water un-interrupted through the other for various compelling reasons. To achieve the inter-connectivity, wherever cross regulator (CR) cum escapes in the existing old canal towards the common bank has been provided, a similar CR cum escape shall be provided in the new parallel canal. In other cases a set of CR cum escape structure (towards common bank side) shall be provided at suitable interval of parallel canal reach that is at every one-fifth of the total reach length.

Further, while attending any repair/renovation work under such condition adequate precautions shall be taken by putting well points, etc, to check building up of pore pressure in the common bank.

5.7 Pressure Release Valves

5.7.1 Pressure release valves (which open into the canal) are provided to relieve excessive hydrostatic pressure behind lining. The valves should be provided in pockets filled with graded filter underneath the lining. The pockets may be cylindrical with diameter as 850 mm or cubical with sides as 850 mm. Horizontal and vertical pressure release valves are installed. 50 mm to 75 mm diameter valves are normally used in the side slopes and 100 to 150 mm diameter valves are used in the bed. The number of rows of pressure release valves in the slopes of canal should be such that for each 4 m width along the slope, a row is provided. The first row should be provided at the junction of the curve and the sides. The number of rows on the bed of the canals shall be such that for very 10 m bed width a row is provided. The spacing of the pressure release valves in a row should be decided on the basis of experiments carried out on models simulating site conditions. Valves in adjacent rows should be staggered. The longitudinal drains consisting of open jointed pipes encased in graded filter should have outlets in a trench of width 45 cm and depth 50 cm. The trench should be filled with graded filter and have outlet into the canal through pressure release valves. The outlet may be provided through precast concrete boxes collecting water from drains with pressure release valves on the top of boxes.

5.7.2 Pressure release valves may, however, be useful in case of slow operational variations, as also serve to release excessive pressure built up through seams of pervious material present in the sub-grade bank material. Furthermore, the moving part of pressure release valves may get damaged or get rusted in course of time so each one of them must be inspected and repaired (if required) at least once a year.

5.7.3 Where the lining is subjected to differential pressure due to very high spring level or large operational conditions, requiring variation as in the case of power channels, the most effective measure to release excess pressure on the lining is to provide continuous filter with adequate outlets to release seepage water.

5.8 Boulder Set Pocket

Where the sub-grade material is not free draining, 1 m × 1 m filter pockets with open jointed boulder set encased in G.I. wire shall be provided at 5 m c/c in longitudinal drains and on side slopes to replace conventional pressure release valves. Figure 4 shows the typical details of such an arrangement.

5.9 Dwarf Regulators

Dwarf regulators are regulators of part height constructed across lined canals at suitable interval for pounding up water to counteract excess uplift pressure below the lining. These are provided in areas where the water table remains continuously high and the conventional pressure release arrangements are not likely to prove effective. The height and spacing of the dwarf regulators shall depend upon the minimum depth of water required to be maintained inside the canal for counter balancing residual pressures for safety of the canal. The regulators also help in maintaining minimum water depth inside the canal even when the canal is operated at part capacity with lower normal depths. Their disadvantage is that the canal made stable with dwarf regulator cannot be emptied for repairs (till the water table goes down to bed level) and these may cause additional head loss in the canal. Under drainage arrangement shall be as per the recommendation of IS 4558.

5.10 Rate of Draw-Down

For long term stability of lined/unlined canals, the rate of draw-down of water level in the canals has to be judiciously decided based on the experience and data of canals in similar formations. The canal lining is not designed for very fast rate of lowering which may result in greater differential head due to difference between rate of lowering of water in the canal and the rate of reduction in the pore pressure behind the lining due to time lag in the drainage of sub-grade. Thus the first 30 cm from FSL may be lowered in 1h but thereafter this rate may be as low as 3 cm/h. Data of ground water table particularly in monsoon and type sub-grade (in cutting and filling), drainage arrangements, if any, shall be kept in view while fixing the rate of draw down.

5.11 Saturation of Common Bank

The common bank of the parallel canals is likely to be saturated due to standing water in the canals and/or rainfall. This ultimately leads to sloughing of banks and further leading to collapse of lining. Silty soils are prone to such a phenomenon. To prevent saturation of the common bank, top of the bank may be provided with a clayey gravel/clayey sand or the same may be covered with a plastic film/membrane (with soil cover) to make it impermeable. Catch water drains may be provided parallel to the canal bank and suitably drained into the canal at about 30m interval and should be maintained regularly.

5.12 Compaction of Sub-Grade

Inadequate compaction of sub-grade also results in failure of the banks as well as failure of lining. As such, the compaction of sub-grade depending on the type of soil should be ensured during execution. For sub-grade consisting of soil, compaction is to be done at optimum moisture content (OMC) in layers not more than 15 cm thick where dry density of natural soil is not less than 1.8 tonne/m^3, the initial excavation is to be done up to about 30 cm above the final section. Lip cutting of 50 cm to 100 cm in banks should be provided. The cutting to final shape should be done immediately before lining. The preparation and compaction of sub-grade shall be done as per IS 3873.

5.13 Provision of Top Coping

In case of lined canals, the top coping at the end of lining should be sufficient to cover the filter provided behind the lining, otherwise the soil particles along with rain water clog the filter. Also the rain water shall not flow along the back side of the lining due to the adequate length of the coping. In case of parallel canals, the coping width could be kept as 350 mm to 600 mm. Top coping for a typical section is given at Fig. 5.

5.14 Leakage Through Joints

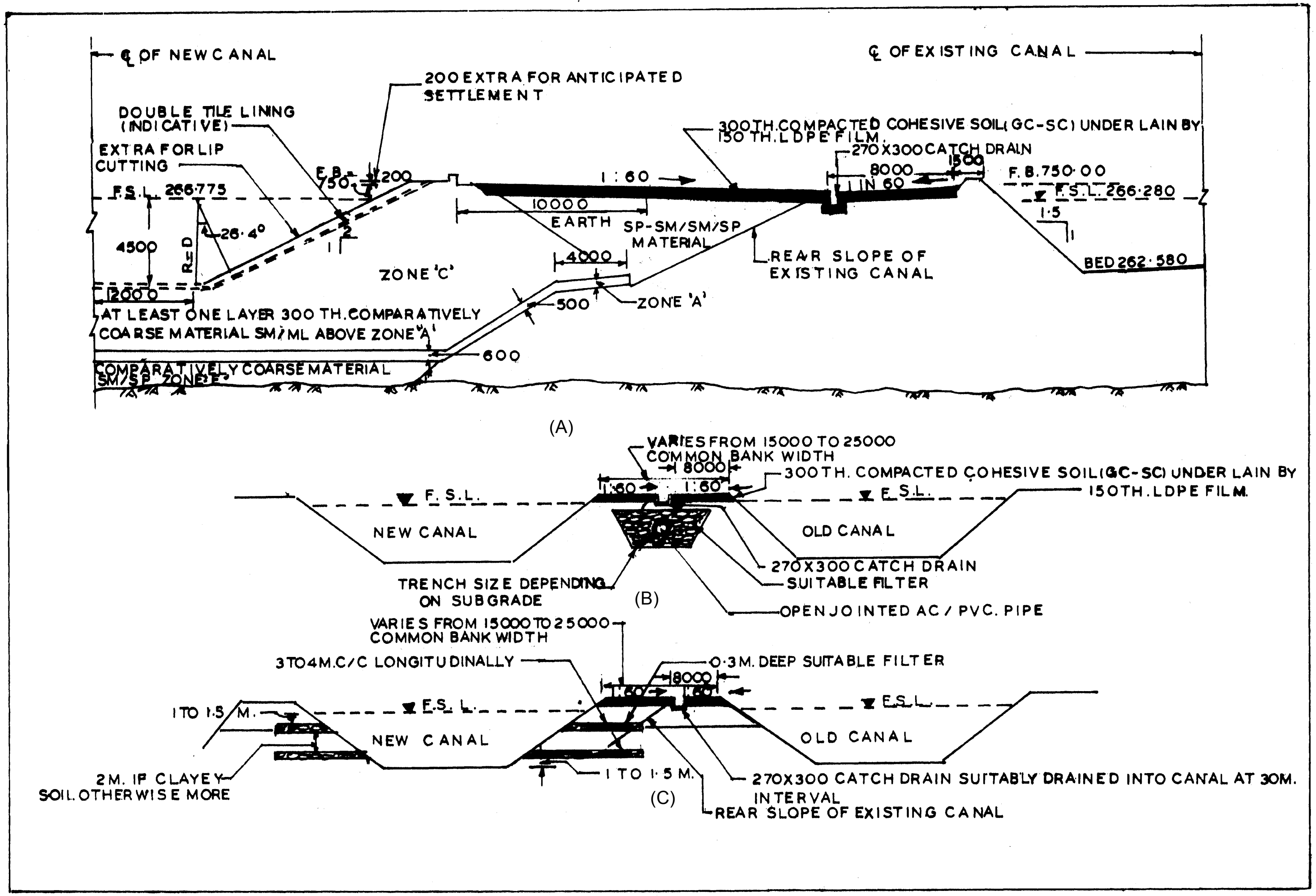
In lined canals the velocity of flow is between 1.8 to 2.2 m/s. Where the joints are weak, the soil particles of the embankment may be sucked and a cavity may form behind the lining, which ultimately may result in the collapse of lining over a period of time. As such suitable steps have to be taken to provide durable joints in the lining like providing strips of PVC or other appropriate material in joints or slipper below the joint.

ANNEX A

(*Clause* 4.1.2)

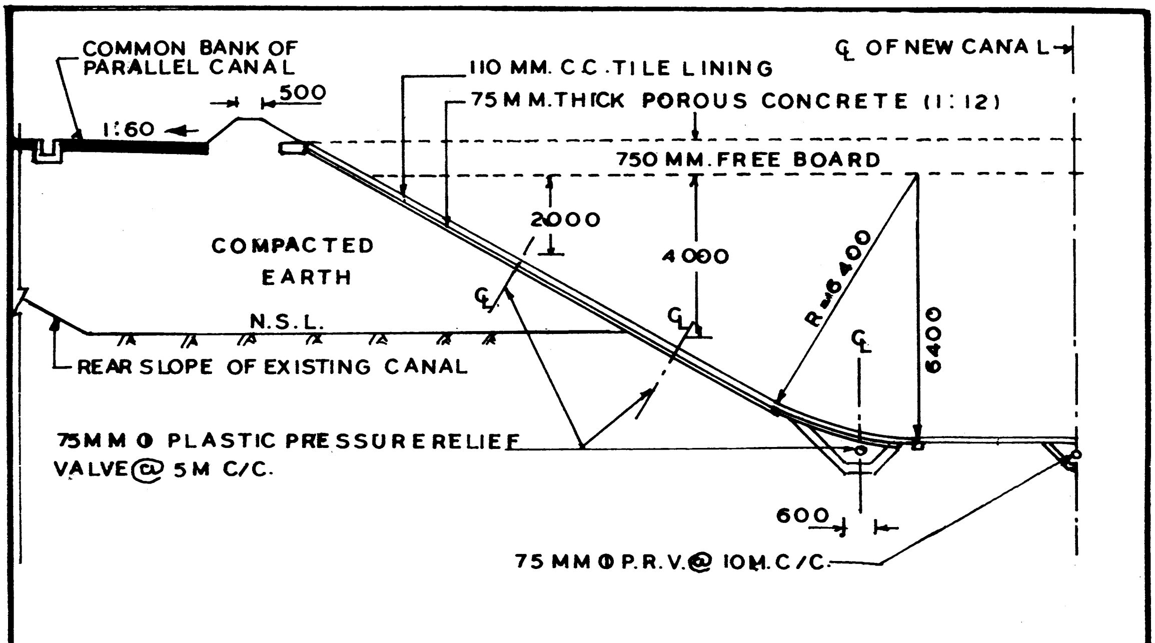
CLASSIFICATION OF SOILS AND THEIR SUITABILITY FOR CANAL LINING

Sl No. (1)	**Soil Classification and Relative Rating** (2)	**Soil Description** (3)	**Remarks** (4)
i)	GP	Poorly graded gravel or gravel	Extremely permeable needs lining
ii)	GW	Well graded gravel, gravel	Extremely permeable need lining
iii)	SP	Poorly graded sands or gravelly sands, little or no fines	Moderate to highly permeable, usually requires lining
iv)	SW	Well graded sands, gravelly sands, little or no fines	Moderately permeable, usually requires lining
v)	CH	Inorganic clays of high plasticity	Very impermeable when wet or extremely permeable after drying. Needs special consideration
vi)	ML	Inorganic silts and very fine sand, silty or clayey fine sand with little/no plasticity	Fairly impervious, but bank section is difficult to hold in place. Need consideration
vii)	MH	Inorganic silts of high compressibility micaceous or diatomaceous fine sandy or silty soils, elastic silts	Fairly impervious, but bank section difficult to hold. Needs special consideration
viii)	GC	Clayey gravels, poorly graded Gravel-sand-clay mixtures	May range from moderate to very low permeability
ix)	SC	Clayey sands, poorly graded sand clay mixtures	Usually impermeable, good stability
x)	GM	Silty gravel, poorly graded gravel sand silt mixtures	Usually fairly impermeable but hard to hold on bank. Lining requirement is minimal
xi)	CL	Inorganic clays, gravelly/sandy silty clays, lean clays of low plasticity	Usually very impermeable. Lining requirement is minimal
xii)	OL	Organic silts and silts clay of low plasticity	Permeability fairly low but stability is questionable. Provision of lining needs judicious consideration
xiii)	OH	Organic clays of medium to high plasticity	Low permeability if soil is kept wet but stability is questionable and shrinkage cracks are probable. Provision of lining needs judicious considerations

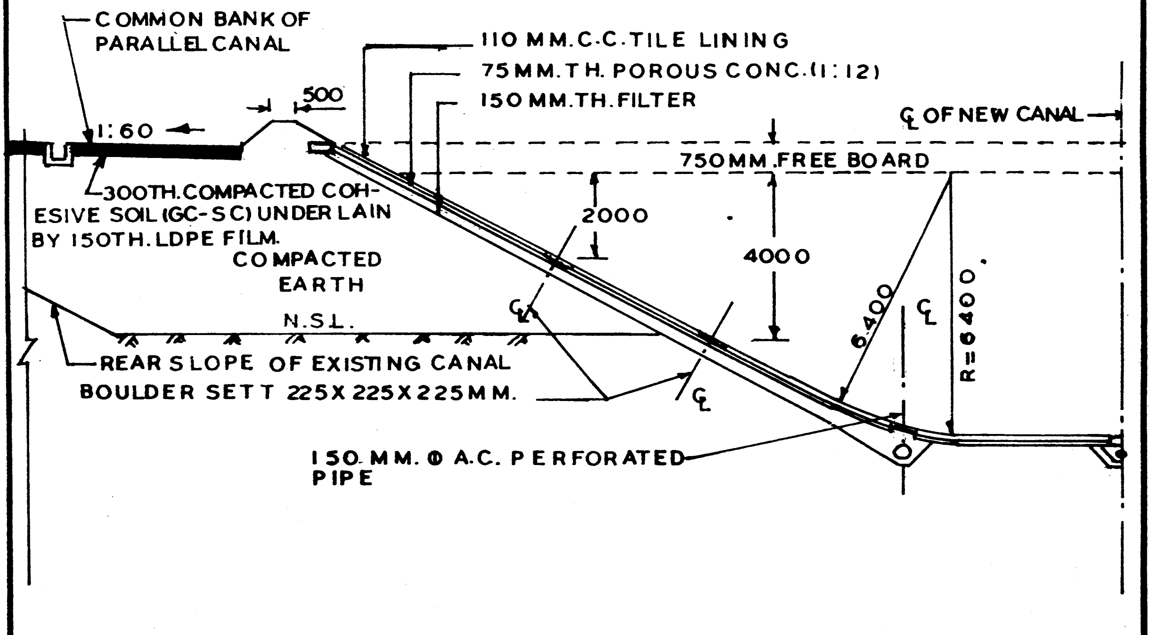

℄ OF NEW CANAL
℄ OF EXISTING CANAL
200 EXTRA FOR ANTICIPATED SETTLEMENT
DOUBLE TILE LINING (INDICATIVE)
EXTRA FOR LIP CUTTING
F.B. = 750
200
F.S.L. 266·775
4500
R = D
26·4°
2
1
ZONE 'C'
1200
AT LEAST ONE LAYER 300 TH. COMPARATIVELY COARSE MATERIAL SM/ML ABOVE ZONE 'A'
COMPARATIVELY COARSE MATERIAL SM/SP ZONE 'E'
1 : 60
10000
EARTH SP-SM/SM/SP MATERIAL
4000
500
ZONE 'A'
600
300 TH. COMPACTED COHESIVE SOIL (GC-SC) UNDER LAIN BY 150 TH. LDPE FILM.
270 X 300 CATCH DRAIN
8000
1500
1 IN 60
F.B. 750·00
F.S.L. 266·280
1·5
1
BED 262·580
REAR SLOPE OF EXISTING CANAL
(A)
VARIES FROM 15000 TO 25000 COMMON BANK WIDTH
8000
1:60
1:60
300 TH. COMPACTED COHESIVE SOIL (GC-SC) UNDER LAIN BY 150 TH. LDPE FILM.
F.S.L.
F.S.L.
NEW CANAL
OLD CANAL
270 X 300 CATCH DRAIN
SUITABLE FILTER
OPEN JOINTED AC / PVC. PIPE
TRENCH SIZE DEPENDING ON SUBGRADE
(B)
VARIES FROM 15000 TO 25000 COMMON BANK WIDTH
3 TO 4 M. C/C LONGITUDINALLY
0·3 M. DEEP SUITABLE FILTER
8000
1:60
1:60
F.S.L.
F.S.L.
1 TO 1·5 M.
NEW CANAL
OLD CANAL
2 M. IF CLAYEY SOIL. OTHERWISE MORE
1 TO 1·5 M.
270 X 300 CATCH DRAIN SUITABLY DRAINED INTO CANAL AT 30 M. INTERVAL
REAR SLOPE OF EXISTING CANAL
(C)

All dimensions in millimetres.

Fig. 1 Drainage Arrangement Below Common Bank of Parallel Canals


COMMON BANK OF PARALLEL CANAL
1:60
500
110 MM. C.C.TILE LINING
75 MM.THICK POROUS CONCRETE (1 : 12)
℄ OF NEW CANAL
750 MM. FREE BOARD
2000
4000
R=6400
6400
COMPACTED EARTH
N.S.L.
℄
REAR SLOPE OF EXISTING CANAL
75MM Φ PLASTIC PRESSURE RELIEF VALVE @ 5 M C/C.
600
75 MM Φ P.R.V. @ 10M.C/C.

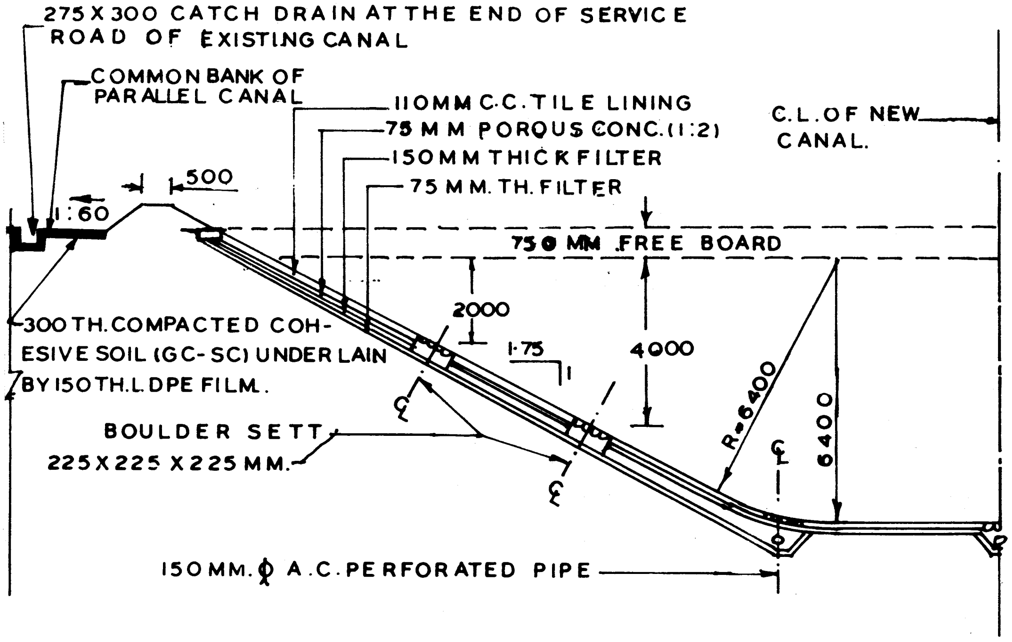
(A) FREE DRAINING SUBGRADE


COMMON BANK OF PARALLEL CANAL
1:60
500
110 MM.C.C.TILE LINING
75MM.TH. POROUS CONC.(1 : 12)
150 MM.TH.FILTER
℄ OF NEW CANAL
750MM.FREE BOARD
2000
4000
6400
R=6400
300TH.COMPACTED COHESIVE SOIL (GC-SC) UNDER LAIN BY 150TH.LDPE FILM.
COMPACTED EARTH
N.S.L.
℄
REAR SLOPE OF EXISTING CANAL
BOULDER SETT 225X225X225MM.
150 MM. Φ A.C. PERFORATED PIPE

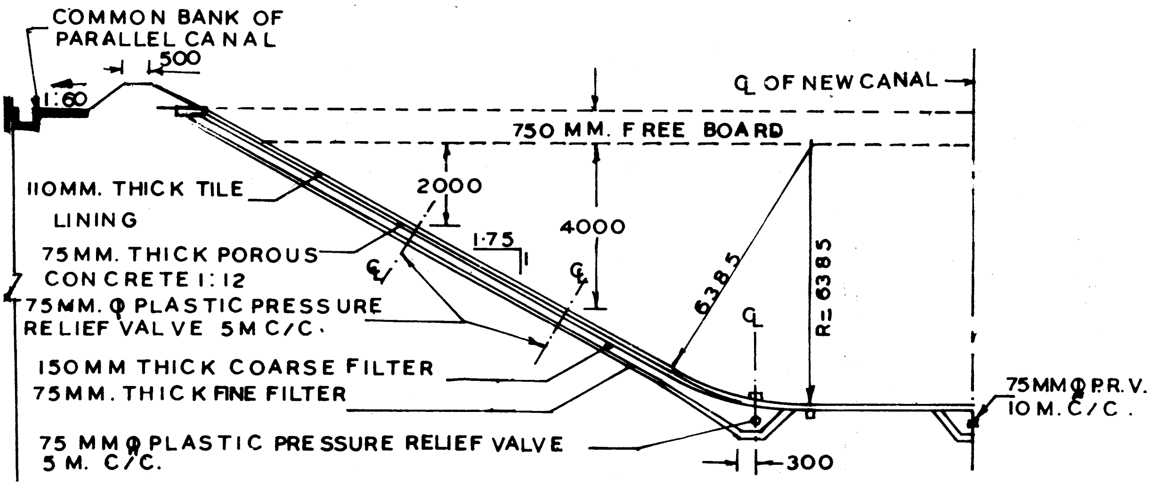
(B) NON FREE DRAINING SUBGRADE

All dimensions in millimetres.

Fig. 2 Details of Lining and Drainage in Filling Section


275 X 300 CATCH DRAIN AT THE END OF SERVICE ROAD OF EXISTING CANAL
COMMON BANK OF PARALLEL CANAL
110MM C.C. TILE LINING
75 MM POROUS CONC. (1:2)
150MM THICK FILTER
75 MM. TH. FILTER
C.L. OF NEW CANAL.
500
1:60
750 MM FREE BOARD
2000
4000
1.75
1
300 TH. COMPACTED COHESIVE SOIL (GC-SC) UNDER LAIN BY 150 TH. LDPE FILM.
BOULDER SETT 225 X 225 X 225 MM.
R=6400
6400
℄
150MM. ϕ A.C. PERFORATED PIPE

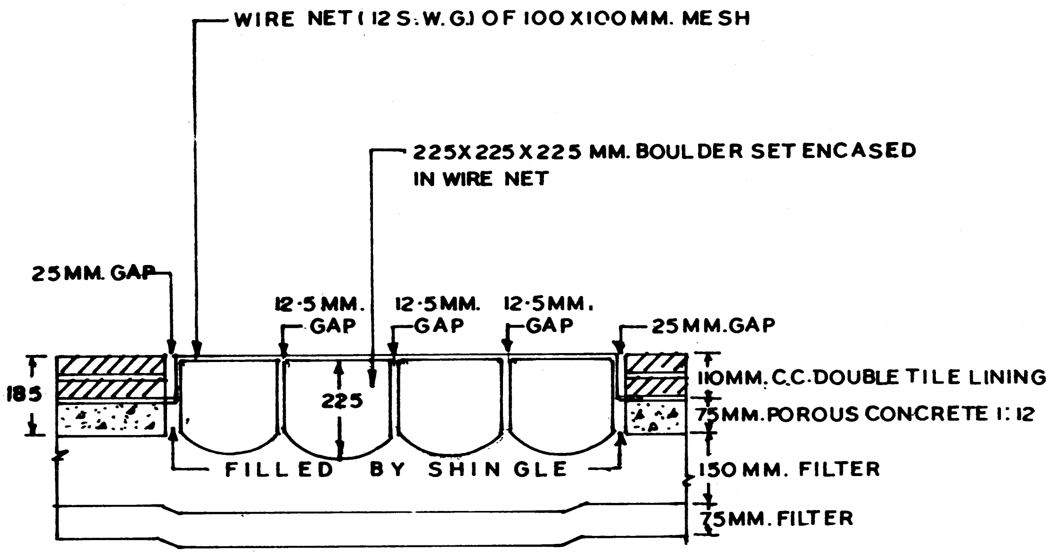
(A) NONFREE DRAINING SUB-GRADE


COMMON BANK OF PARALLEL CANAL
500
1:60
℄ OF NEW CANAL
750 MM. FREE BOARD
2000
4000
1.75
1
110MM. THICK TILE LINING
75MM. THICK POROUS CONCRETE 1:12
75MM. ϕ PLASTIC PRESSURE RELIEF VALVE 5M C/C.
150MM THICK COARSE FILTER
75MM. THICK FINE FILTER
75 MM ϕ PLASTIC PRESSURE RELIEF VALVE 5 M. C/C.
6385
R= 6385
℄
300
75MM ϕ P.R.V. 10 M. C/C.

(B) FREE DRAINING SUB-GRADE

All dimensions in millimeters.

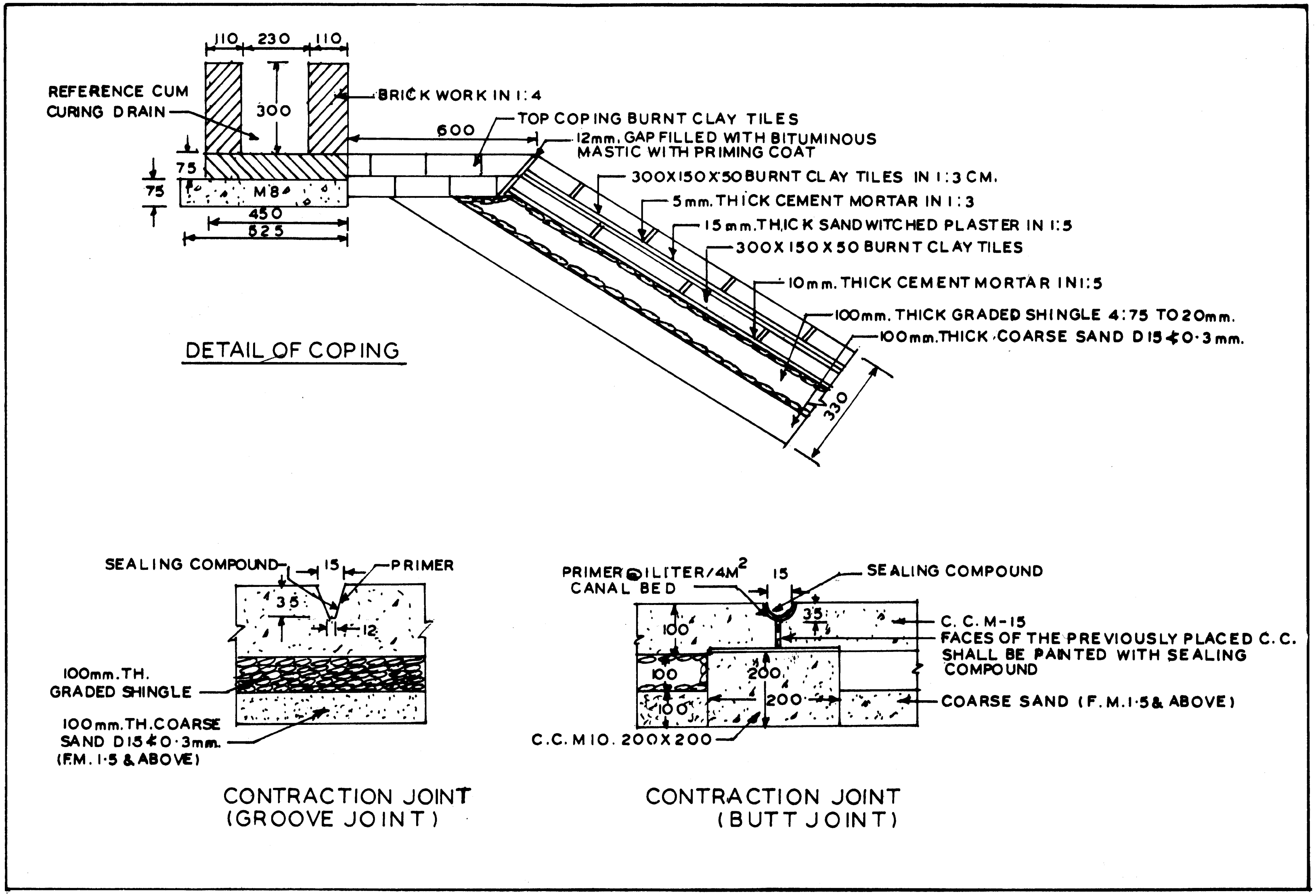
FIG. 3 DETAILS OF LINING AND DRAINAGE IN CUTTING-SECTION


WIRE NET (12 S.W.G.) OF 100 X100 MM. MESH
225X225X225 MM. BOULDER SET ENCASED IN WIRE NET
25 MM. GAP
12·5 MM. GAP
12·5 MM. GAP
12·5 MM. GAP
25 MM.GAP
185
225
110MM. C.C.DOUBLE TILE LINING
75MM.POROUS CONCRETE 1: 12
FILLED BY SHINGLE
150 MM. FILTER
75MM. FILTER

(Sub-Grade Comprising of Very Fine Sand, Mixture of Sand, Silt & Clay and Clays. Permeability less than 10^{-4} cm/s and Grater Than 10^{-6} cm/s)

All dimensions in millimeters.

FIG. 4 DETAILS OF BOULDER SET POCKETS IN NON-FREE SUB-GRADE


110
230
110
REFERENCE CUM CURING DRAIN
300
BRICK WORK IN 1:4
TOP COPING BURNT CLAY TILES
600
12mm. GAP FILLED WITH BITUMINOUS MASTIC WITH PRIMING COAT
75
75
M 80
450
625
300X150X50 BURNT CLAY TILES IN 1:3 CM.
5mm. THICK CEMENT MORTAR IN 1:3
15mm. THICK SANDWITCHED PLASTER IN 1:5
300X150X50 BURNT CLAY TILES
10mm. THICK CEMENT MORTAR IN 1:5
100mm. THICK GRADED SHINGLE 4.75 TO 20mm.
100mm. THICK COARSE SAND D15 ≮ 0·3 mm.
330
DETAIL OF COPING
SEALING COMPOUND
15
PRIMER
35
12
100mm. TH. GRADED SHINGLE
100mm. TH. COARSE SAND D15 ≮ 0·3mm. (F.M. 1·5 & ABOVE)
CONTRACTION JOINT (GROOVE JOINT)
PRIMER @ 1 LITER/4M²
CANAL BED
15
SEALING COMPOUND
35
100
100
100
200
200
C.C. M-15
FACES OF THE PREVIOUSLY PLACED C.C. SHALL BE PAINTED WITH SEALING COMPOUND
COARSE SAND (F.M. 1·5 & ABOVE)
C.C. M 10. 200X200
CONTRACTION JOINT (BUTT JOINT)

All dimensions in millimetres.

FIG. 5 DETAILS OF COPING AND JOINTS

Bureau of Indian Standards

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